# Commonwealth of Kentucky
# Division for Air Quality

## PERMIT APPLICATION SUMMARY FORM

Completed by: Andrew True

GENERAL INFORMATION:

| | |
|---|---|
| Name: | Westlake Vinyls, Inc. |
| Address: | 2468 Industrial Parkway<br>Calvert City, Kentucky 42029 |
| Date application received: | 12/30/2004 |
| SIC Code/SIC description: | 2812, 2869, Alkalines and Chlorine, Industrial Organic Chemicals |
| Source ID: | 21-157-00039 |
| Source A.I. #: | 2966 |
| Activity ID: | APE20050001 |
| Permit: | V-05-011 |

APPLICATION TYPE/PERMIT ACTIVITY:

| | |
|---|---|
| [ ] Initial issuance | [ ] General permit |
| [ ] Permit modification | [ ] Conditional major |
| __Administrative | [X] Title V |
| __Minor | [ ] Synthetic minor |
| __Significant | [ ] Operating |
| [X] Permit renewal | [X] Construction/operating |

COMPLIANCE SUMMARY:

[ ] Source is out of compliance [ ] Compliance schedule included

[X] Compliance certification signed

APPLICABLE REQUIREMENTS LIST:

| | | |
|---|---|---|
| [ ] NSR | [X] NSPS | [X] SIP |
| [ ] PSD | [X] NESHAPS | [ ] Other |
| [ ] Netted out of PSD/NSR | [ ] Not major modification per 401 KAR 51:001, 1(116)(b) | |

MISCELLANEOUS:

[ ] Acid rain source

[ ] Source subject to 112(r)

[X] Source applied for federally enforceable emissions cap

[ ] Source provided terms for alternative operating scenarios

[X] Source subject to a MACT standard

[ ] Source requested case-by-case 112(g) or (j) determination

[ ] Application proposes new control technology

[X] Certified by responsible official

[X] Diagrams or drawings included

[ ] Confidential business information (CBI) submitted in application

[ ] Pollution Prevention Measures

[ ] Area is non-attainment (list pollutants):

EMISSIONS SUMMARY:

| **Pollutant** | **Actual (tpy)** | **Potential (tpy)** |
|---|---|---|
| $PM/PM_{10}$ | 46.73 | 292.11 |
| $SO_2$ | 2.63 | 1173.4 |
| NOx | 611.62 | 1602.4 |
| CO | 447.83 | 905.51 |
| VOC | 112.26 | 238.21 |
| **Single HAPs** | | |
| Benzene | 0.1431 | 10.98 |
| Butadiene | 0.18349 | 3.33 |
| Styrene | 0 | 0.17 |
| Toluene | 0.0034524 | 2.41 |
| Methyl Alcohol | 0 | 0.09 |
| 1,2 Dichloroethylene | 0 | 0.04 |
| 1,1, 2, 2 Tetrachloroethane | 0 | 0.11 |
| Chlorobenzene | 0 | 0.02 |
| 1,1,2-Trichloroethane | 0.0104315 | 0.19 |
| carbon tetrachloride | 0 | 5.58 |
| chloroform | 0.0371501 | 1.64 |
| 1,2 Dichloroethane (EDC) | 5.1576663 | 15.45 |
| 1, 1, 2 trichloroethylene | 0 | 0.0049 |
| tetrachloroethylene | 0 | 0.03 |
| 1,1-Dichloroethane | 0 | 0.06 |
| VCI | 6.9674692 | 17.75 |
| Xylenes | 0 | 1.35 |
| Alpha Methystyrene | 0 | 0.03 |
| ethylbenzene | 0 | 0.08 |
| Napthalene | 0 | 0.07 |
| Chromium | 0 | 0.0018 |
| ethyl chloride (chloroethane) | 0 | 0.39 |
| methyl chloride | 0 | 0.058 |
| 1, 2, 4-trimethylbenzene | 0 | 0.000003825 |
| vinylidene chloride | 0 | 0.00198 |
| **Source-wide HAPs** | | 59.83 |

## SOURCE DESCRIPTION:

North American Pipe Corporation, Westlake PVC Corporation, and Westlake Vinyls Incorporated are all subsidiaries of Westlake Chemical Corporation. The three facilities are located within a contiguous area. Even though the facilities have separate Title V permits, the facilities are a single major source, pursuant to 401 KAR 52:001 Section 1(45)(a) definitions. Each owner/operator is responsible and liable for their own violations, unless there is a joint cause for the violations. Westlake PVC Corporation and Westlake Vinyls Inc. are a single major source, as defined by 401 KAR 52:020, Title V Permits, and 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality (PSD). The source has applied for permit renewal on December 20, 2004. This permit document covers only Westlake Vinyls Inc.

The Westlake Vinyls Plant is organized into four operational areas as follows: Chlor-Alkali Plant; Ethylene (Olefins) Plant; Energy & Environmental Operations; and the Monomer Plant. The Chlor-Alkali portion processes treated brine to produce chlorine, sodium hydroxide, and hydrogen gas using a membrane cell electrolyzer process. Chlorine Plant vent streams from process operations, including plant shutdowns, are collected and vented through the Sodium Hypochlorite Tower (EPN 813) and the Atmospheric Scrubber (EPN 877). HCl is produced by reacting chlorine with hydrogen and absorbing the HCl in water within the HCl Synthesis Scrubber (EPN 887). The primary function of the Olefins or Ethylene plant is to produce high purity ethylene through hydro-cracking of propane or ethane feedstock. The efficiency of the process depends to a great extent on the simultaneous recovery of useful and profitable co-products such as propylene, mixed butanes, aromatic gasoline, fuel oil, and fuel gas. The Energy & Environmental process unit provides utilities such as steam for the Westlake Vinyls plant and manages the wastewater treatment plants.

The Westlake Monomers plant produces vinyl chloride monomer through the thermal decomposition of 1,2 dichloroethane (EDC) to form vinyl chloride monomer (VCM) and hydrogen chloride (HCl). The pyrolysis reaction takes place at elevated temperature and pressure in a gas-fired furnace. The gaseous reaction products, together with any unconverted EDC, are rapidly cooled and partially condensed by quenching with cooled EDC liquid in a quench column. During the pyrolysis process some coke is formed. Coke on the furnace tubes is periodically removed and collected during the furnace decoking operations. Products then go through a series of distillation and recovery steps to recover the VCM. The EDC-VCM process consists of 8 main sections - EDC Thermal Cracking, VCM-HCl Distillation, Hydrogenation Reaction, EDC Oxychlorination Reaction, EDC Recovery, EDC High Temperature Reaction, EDC Distillation, and Catoxid Reaction. Vents from the EDC recovery section are scrubbed with cold circulating solvent to recover residual EDC, and the recovered EDC is returned to the EDC recovery section. Vent gas from the EDC recovery section is fed to the Oxy Incinerator and/or the Primary Incinerator. Periodically, one of the incinerators must be temporarily taken out of service for maintenance. During these maintenance events, some of waste gas streams may be routed through the South Synthesis EDC Absorber.

## EMISSIONS AND OPERATING CAPS DESCRIPTIONS:

None

## OPERATIONAL FLEXIBILITY:

Not applicable